

CLAIMS

We claim:

1. A fixing device for injection needles, for pushing onto a thread of an injection apparatus, wherein said fixing device is formed as a cap comprising an open end and a closed end which holds a needle perpendicularly in the middle, and a surface area of the fixing device is slightly spring-elastic in its circumference and comprises at least three cams directed to said thread, said cams perpendicularly engaging with flights of the thread when said cap is pushed onto the thread, wherein each cam comprises at least one notch arranged parallel to the surface circumference.
2. The fixing device for injection needles as set forth in claim 1, wherein each cam has at least two tips which perpendicularly engage with the thread.
3. The fixing device for injection needles as set forth in claim 2, wherein said tips of the notched cams provide at least three points of contact which are not in the same plane.
4. The fixing device for injection needles as set forth in claim 1, wherein the distance between the tips of each notched cam is at least equal to the height of said flight.
5. The fixing device for injection needles as set forth in claim 1, wherein the surface area of the cap cannot be elastically deformed in its height, and wherein spring elements are fixed to the cap and hold the notched cams.
6. The fixing device for injection needles as set forth in claim 5, wherein said spring elements are connected to the cap in the region of the ends thereof, whereby the spring elements comprise bending beams, a notched cam being fixed to the center-point of each, and the tips of the cams always engaging perpendicularly with the flights.

7. The fixing device for injection needles as set forth in claim 6, wherein the spring elements are segments of the surface area of the cap, made of the same material, which are connected to the cap in a material bond at the upper and lower end and have a wall thickness which can be elastically deformed and is correspondingly smaller than that of the rigid surface area of the cap, and comprise fixed, notched cams in their middle which are made of the same material, the tips of said cams perpendicularly engaging with the flights.
8. The fixing device for injection needles as set forth in claim 7, wherein the cap, its spring elements and its notched cams are produced from one part.
9. The fixing device for injection needles as set forth in claim 8, wherein said one part is an injection-molded part.
10. The fixing device for injection needles as set forth in claim 9, wherein the one part is formed of a thermoplastic plastic.
11. The fixing device for injection needles as set forth in claim 10, wherein said thermoplastic plastic is PCTG (polycyclohexylene-dimethylene-terephthalate).
12. The fixing device for injection needles as set forth in claim 1, wherein the injection apparatus comprises a storage container, and wherein one end of the needle protrudes into the cap such that the one end of the needle penetrates into the storage container when the cap is pushed onto the thread of the injection apparatus.
13. The fixing device for injection needles as set forth in claim 1, wherein the cap comprises a circumference and at least five spring elements with notched cams, said five spring elements at regular intervals around said circumference.
14. The fixing device for injection needles as set forth in claim 13, wherein the cap has an inner diameter of at least 9 mm.

15. The fixing device for injection needles as set forth in claim 1, wherein the needle is a hollow needle smaller than 30-gauge.
16. A device for connecting an injection needle to an injection apparatus, wherein the device provides a plurality of possible points of contact in at least two planes, and wherein the points of contact have associated spring forces for acting generally perpendicularly on the injection apparatus.
17. The device according to claim 16, wherein the possible point of contact are provided by cams carried by the device.
18. The device as set forth in claim 17, wherein each cam has at least two tips.
19. The device as set forth in claim 18, wherein said tips provide at least three points of contact which are not in the same plane.
20. The device according to claim 16, wherein the points of contact are provided by spring elements carried by the device.
21. The device according to claim 20, wherein said spring elements comprise a cam, the cam being notched to provide tips, the tips engaging the injection apparatus generally perpendicularly.
22. The device according to claim 20, wherein the spring elements are segments of a surface area of the device and comprise cams, notched to provide cam tips, the tips generally perpendicularly engaging the injection apparatus.